

Rare Species Memo

National Park Service
U.S. Department of the Interior

Southwest Exotic Plant Management Team
Desert Research Learning Center



Pectis imberbis at Coronado National Memorial

Surveys for *Pectis imberbis* (beardless cinchweed) were conducted on September 3, 2014 at Coronado National Memorial a unit of the National Park Service in southeastern Arizona. Nine biologists and botanists from different federal agencies among them retired scientists, NPS biologists, Forest Service biologists, and FWS ecologists surveyed for *Pectis imberbis* at several sites. Thirty-seven individuals were located near the Administration buildings and forty to fifty plants around the State of Texas Mine. Further surveys were strongly recommended as a result of this initial September 2014 effort.

The beardless cinchweed is a slender perennial in the Asteraceae family and is difficult to pick out when it is not in flower (Figure 1). In flower, it has a delicate aster flower with both disc and ray flowers, the yellowish orange of the ray flowers are offset by the red tips of the disk flowers and often has few in flower at any one time (Figure 2). The preferred habitat of the plant is among large 1-2 m tall bunchgrasses and has slender smooth grayish stems and opposite linear leaves that are dotted on the underside with small red spots (Figure 3). Detection of this species is difficult.

The importance of this species is that a petition has been made for its listing under the Endangered Species Act. It is undergoing its 12-month finding by the US Fish and Wildlife Service and data from these survey efforts will be combined with other information to determine its status. There are substantial gaps in our knowledge of this species and our survey efforts at Coronado National Memorial are contributing to a better understanding of this species.



Figure 1, *Pectis imberbis* in flower, NPS/Laura Fawcett



Figure 2, Flower structure, NPS/Laura Fawcett



Figure 3, Leaves, NPS/Laura Fawcett

The National Park Service Southeast Arizona Group, the Sonoran Desert Network, and the Southwest Exotic Plant Management Team undertook a second round of surveys on October 1, 2014. This second round of surveys included an NPS botanist, two NPS biologists, a geologist,

and two SCA interns. The search parameter had been narrowed by the previous survey in early September to the limestone substrate thought to be important for this species at Coronado NMem. Utilizing the 2011 park geologic map and satellite imagery, several areas of limestone were identified as being target search polygons. Behind and adjacent to the administration buildings, then further upslope toward Coronado Cave to the west. Five additional polygons had been suggested for examination after the original survey, a suggestion that was based on the presence of the limestone substrate.

This second round of surveys began immediately adjacent to the Law Enforcement building at Coronado NMem, where an additional 14 plants were located growing among bunchgrasses. Most of these specimens were flowering which made them more easily visible. These plants are located at 0570714 E, 3468367 N, in the NAD83 datum. The area was surveyed for approximately 30 minutes and a concise population was found in a roughly 30 x 40 m area directly west and upslope from the Law Enforcement building. This area is along a margin of the limestone substrate where it contacts a rhyolitic layer of rock, but there are limestone remnants in the upper soil profile.

The survey continued upslope from this location along a shallow limestone ridge to the west of the populations that were located on September 3rd. The survey consisted of fanning out and moving slowly toward, then up, a 30 degree



Figure 4, *Pectis imberbis* habitat at Coronado NMem, NPS/Laura Fawcett

slope that ended in the first polygon. No plants were located on this steeper south-facing slope. The community found there was largely bunchgrass with patches of *Ipomoea longifolia*, a large flowered morning glory. The first polygon identified was indeed a limestone outcrop, and was not only visible on satellite imagery, but clearly identified in the digital geologic data layer created by NPS geologists in 2011. This first polygon was surveyed for 50 minutes and no plants were located.

The dominant vegetation on top of the ridge was an ocotillo (*Fouquieria splendens*) and mariola (*Parthenium incanum*) shrubland. The understory of this particular community is substantially more sparse than the bunchgrass habitat clearly preferred by *Pectis imberbis*. The limestone substrate found in this first polygon is actually a band of rock stretching to the west. This is the area where limestone expresses on the surface and is cut by deep canyons that trend generally north to south and perpendicular to the bedrock layer. The limestone band is approximately 300 m wide at most but is on very steep, unstable slopes that make overland survey difficult.

The survey party fanned out once again and moved slowly downslope through the limestone toward Blue Waterfall. This community was a much denser shrubland with fewer bunchgrasses.



Figure 5, Red dots on leaf underside, NPS/Laura Fawcett

Downslope on the hill the grasses became more numerous and approximately 20 m from the top of the Blue Waterfall, a second population was located. The population consisted of an additional 10 plants spread across a 15 x 15 m area. The population was 30 m southwest of the mine shaft and 20 m northeast of Blue Waterfall. The population is located at 0570587 E, 3468675 N in the NAD 83 datum. This area was surveyed for an additional 20 minutes, upslope and down, and only 10 plants were located.

The survey went down into the drainage and back up the opposite slope moving toward the west. A single plant was located 40 m northwest of the Blue Waterfall. Additional survey upslope and down within 20 m of the plant yielded nothing further. This plant is located at 0570543 E, 3468668 N in the NAD 83 datum.

The survey party then fanned out on the southeast-facing slope and continued. The survey went down the long ridge on the west side of the canyon with Blue Waterfall at the bottom. This ridge was chosen because of an obvious limestone outcrop further down. The survey route curved across the slope, then down the crest and directly through the limestone outcrops. No additional plants were located along this ridgeline. The bulk of the hillslope grassland community was densely overrun by Lehmann's Lovegrass (*Eragrostis lehmanniana*) and is not appropriate habitat for *Pectis imberbis*.

The limestone at the bottom of the slope was surveyed and no additional *Pectis* was found. One plant of note was located just downslope of the final limestone ridge in the moister soils of the drainage. It was the Mexican gama grass, or *Tripsacum lanceolatum*. This species is unique in its being of subtropical origin and this one of only a few northern populations. It is a relative of both the progenitor of corn, teosinte, and cultivated maize. This species has very distinctive seeds. There were fairly large patches (1-3 m in diameter) of *Tripsacum* on the shaded slopes beneath larger Emory oaks (*Quercus emoryi*).

In the September survey, the Arizona desert foxglove or *Brachystigma wrightii* was noted as being found nearby, but it was not detected near either of these populations. Notable however, were nearby patches of the Santa Rita grama, or *Bouteloua eludens*, a regionally endemic species of bunchgrass. The small patches of *B. eludens* appear to prefer similar soils, but clearly need more open habitat. *Pectis imberbis* prefers to be within and among the denser bunchgrasses.

The real challenge in *Pectis imberbis* surveys and eventual monitoring is the detection problem (Figure 4). It is difficult to spot this species when it is not in flower and in among dense grasses it is doubly difficult. Both populations found in this survey were the result of simply stumbling on a single flowering plant and surveying intensely in the surrounding area. Timing surveys to coincide with warm-season moisture and the cessation and setting in of active flowering and seeding is essential to getting more accurate assessments of total numbers for this species.



Figure 4, An example of the detection problem, note the narrow stems, NPS/Maura Thoenes

Based on the first sampling efforts, around 200 plants are estimated to be in the park. The 2011 Monument fire burned much of the habitat of this species and the resulting flourish of native bunchgrasses appears to provide better habitat and cover. There is no grazing pressure in the

park. In those areas dominated by Lehmann's lovegrass, the species has yet to be detected.

Further surveys will continue at Coronado NMem until November 2014.



Coronado National Memorial, NPS/Maura Thoenes

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No. 1 *Pectis imberbis* at Coronado National Memorial

The Southwest Exotic Plant Management Team (SW-EPMT) works in national park units across the desert southwest to locate, protect, and restore native plants.

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